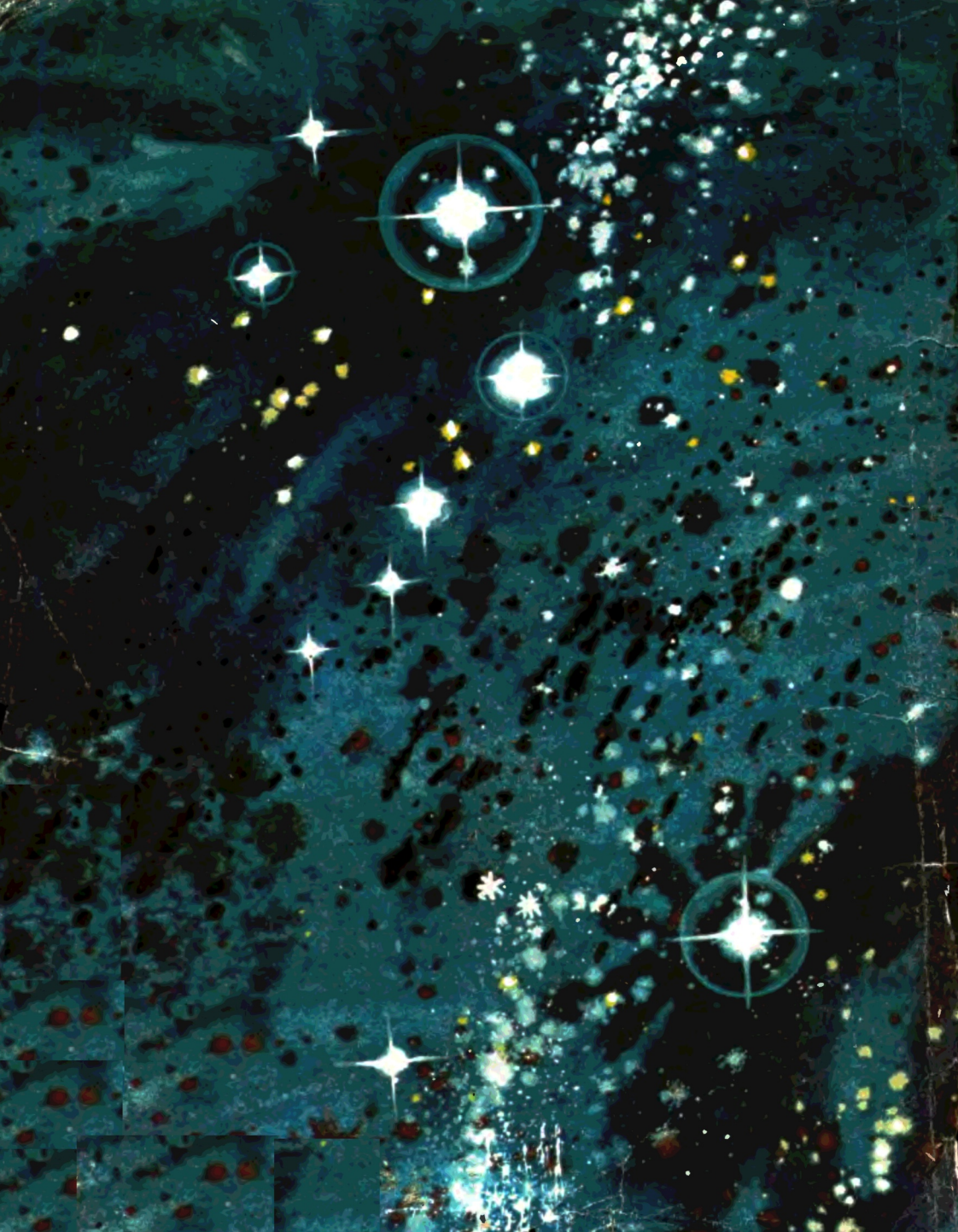


Anatoli Tomilin



THE BLUE  
PLANET  
EARTH

The Mir Titles Project



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# THE BLUE PLANET EARTH



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*Translated from the Russian by Damitr Mazanav*

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For children of primary school age

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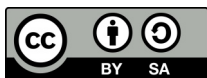
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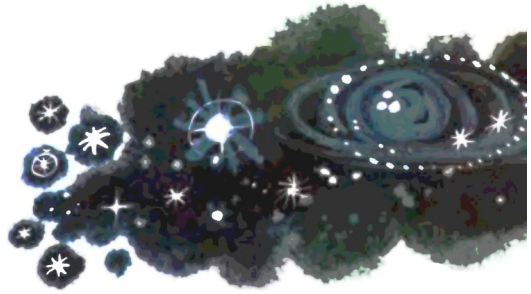
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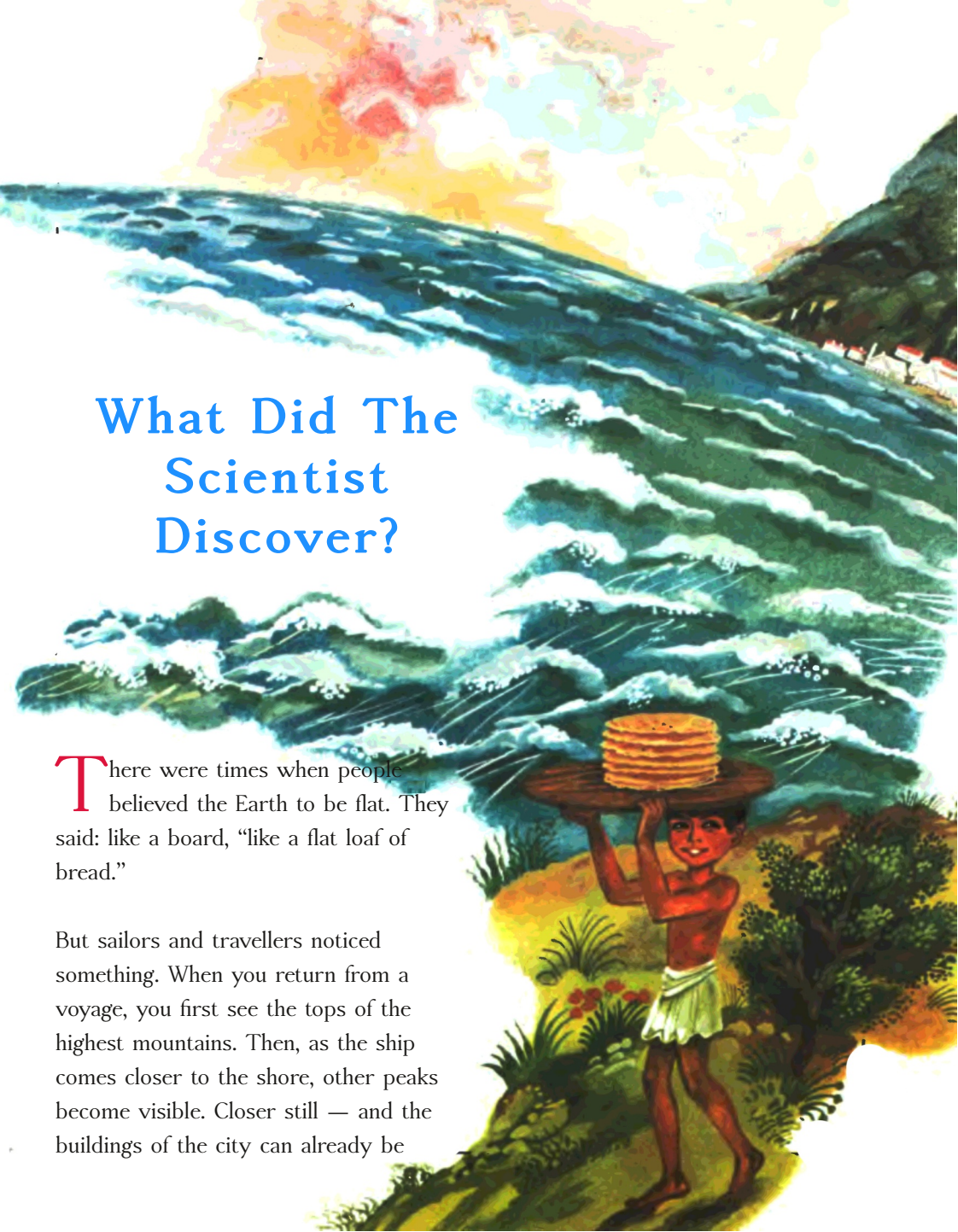






Our Earth is seas, mountains, rivers, lakes, plains, and lowlands. Our Earth is fields, meadows, forests, tundra, and deserts. But our Earth is also a planet of the Solar System. From the shape of the planet Earth, from its rotation around the Sun and around its own axis, depend the alternation of day and night, the change of the seasons, and the change of climate. From the climate depend the vegetation and the animal world on Earth. This book tells about the features of the Earth as a planet.





## What Did The Scientist Discover?

There were times when people believed the Earth to be flat. They said: like a board, “like a flat loaf of bread.”

But sailors and travellers noticed something. When you return from a voyage, you first see the tops of the highest mountains. Then, as the ship comes closer to the shore, other peaks become visible. Closer still — and the buildings of the city can already be





seen. And then at last you can make out the people who have come to meet the ship on the shore.

So, the ancients continued to reflect, the Earth is not like a flat loaf, but rather like the rounded crust of a huge round loaf of bread. On such a rounded surface, the higher an object is, the farther away it can be seen.

In Ancient Greece there lived a scholar named Aristotle. Once, while observing an eclipse of the Moon, he noticed that the dark patch on the Moon was round.

Aristotle thought: "This is the shadow of our Earth. A round shadow! What shape must the Earth have to cast such a shadow every time?"

Aristotle took a flat loaf and went outside on a sunny day. The shadow of the loaf was round. But when he turned it on its edge, the shadow became thin, like a little stick. "No," decided Aristotle, "the Earth cannot be





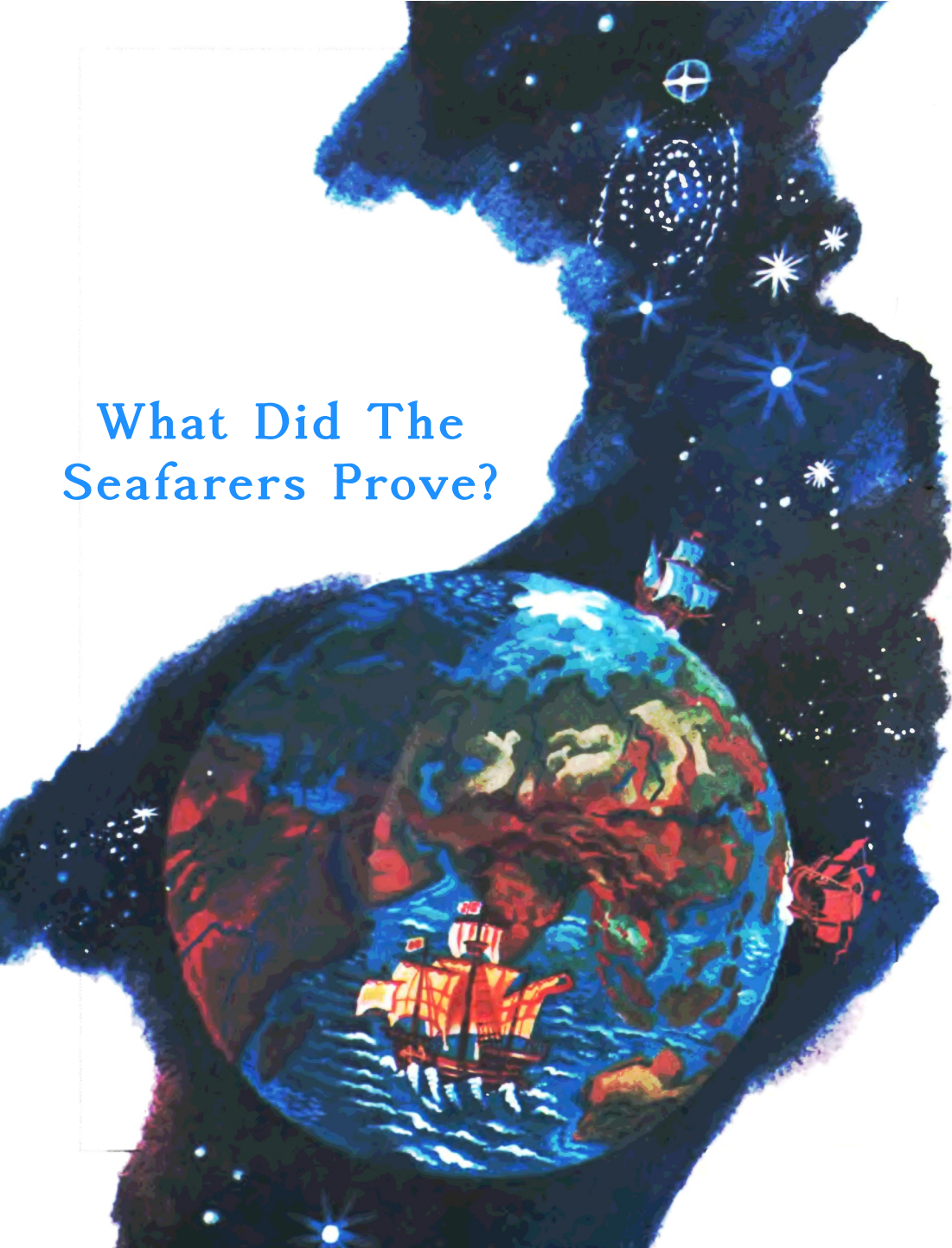


like a flat loaf.”

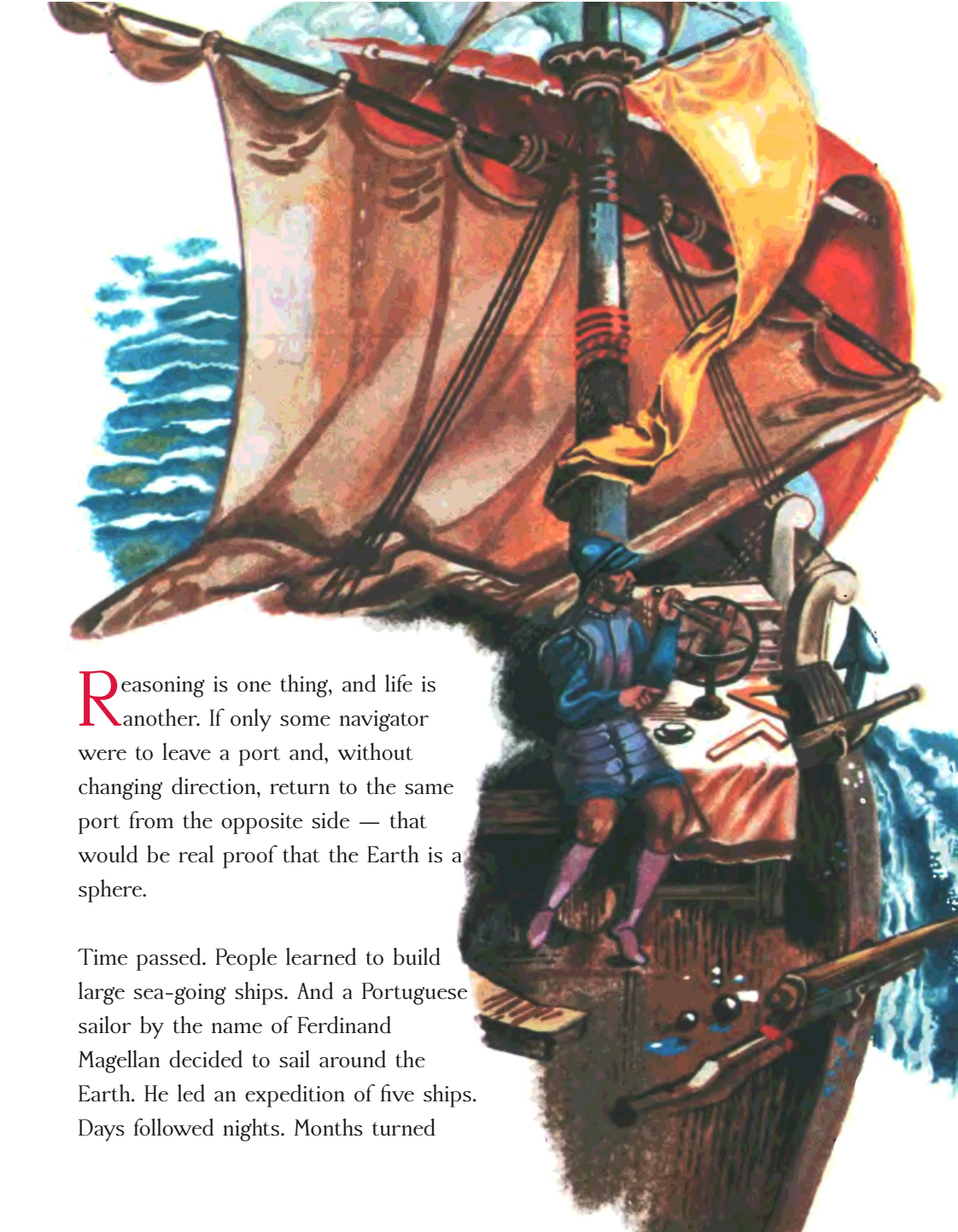
He took half an apple and also held it up to the Sun’s rays. The shadow was round only when the light fell on the cut surface or on the curved side of the apple. As soon as he turned the half apple a little differently, the shadow became an incomplete circle.

“So our Earth cannot be like half an apple either,” Aristotle continued to think. Only the shadow of a whole apple always remained round. “Then the Earth must be like a whole apple — that is, like a complete sphere,” the ancient Greek scholar concluded.

What Did The  
Seafarers Prove?







Reasoning is one thing, and life is another. If only some navigator were to leave a port and, without changing direction, return to the same port from the opposite side — that would be real proof that the Earth is a sphere.

Time passed. People learned to build large sea-going ships. And a Portuguese sailor by the name of Ferdinand Magellan decided to sail around the Earth. He led an expedition of five ships. Days followed nights. Months turned





into years.

One of the sailing ships was wrecked on the rocks. The crew of another turned back home halfway. The third ship had to be burned — it had become too worn out. The fourth was captured. Magellan was killed.

And only a small vessel called “Victoria,” which means “Victory,” returned to its home harbour after three years. Thus, on 6 September 1522, the first circumnavigation in history was completed.

Thus the seafarers proved that the Earth is a sphere.

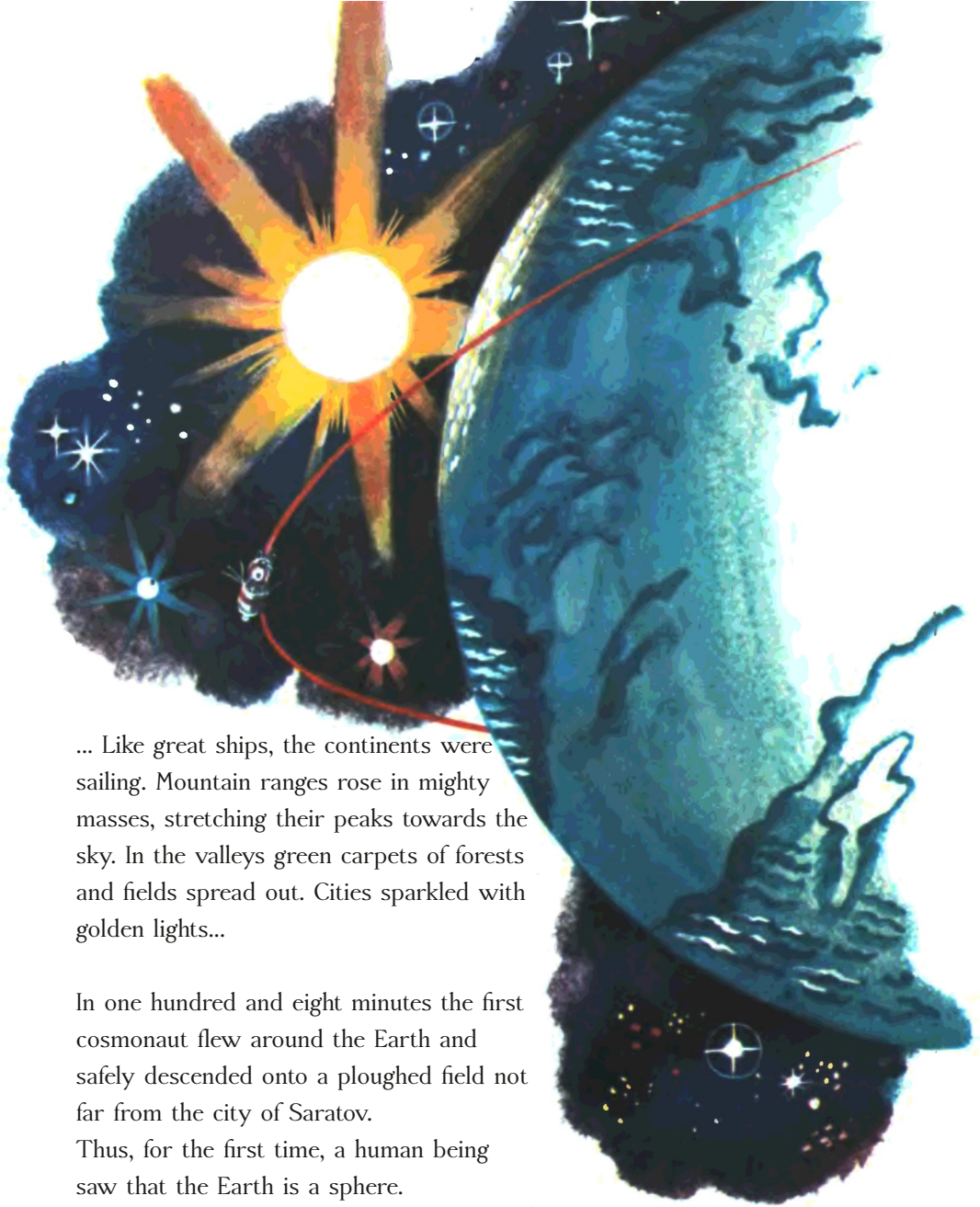
# What Did The Cosmonaut See?



**O**n 12 April 1961, at 9 hours 7 minutes, a rocket was launched from the Soviet cosmodrome Baikonur. It placed into orbit the spacecraft “Vostok-1” with a man on board.

That man was the first cosmonaut of the Earth, Yuri Alekseyevich Gagarin.

He saw our Earth as a whole ... from space.



... Like great ships, the continents were sailing. Mountain ranges rose in mighty masses, stretching their peaks towards the sky. In the valleys green carpets of forests and fields spread out. Cities sparkled with golden lights...

In one hundred and eight minutes the first cosmonaut flew around the Earth and safely descended onto a ploughed field not far from the city of Saratov. Thus, for the first time, a human being saw that the Earth is a sphere.





## What Did Artificial Satellites Help Us To Learn?

**W**e say: the globe. But is it truly a sphere? Or rather, is our Earth a perfect sphere? Artificial satellites of the Earth helped to answer this question.

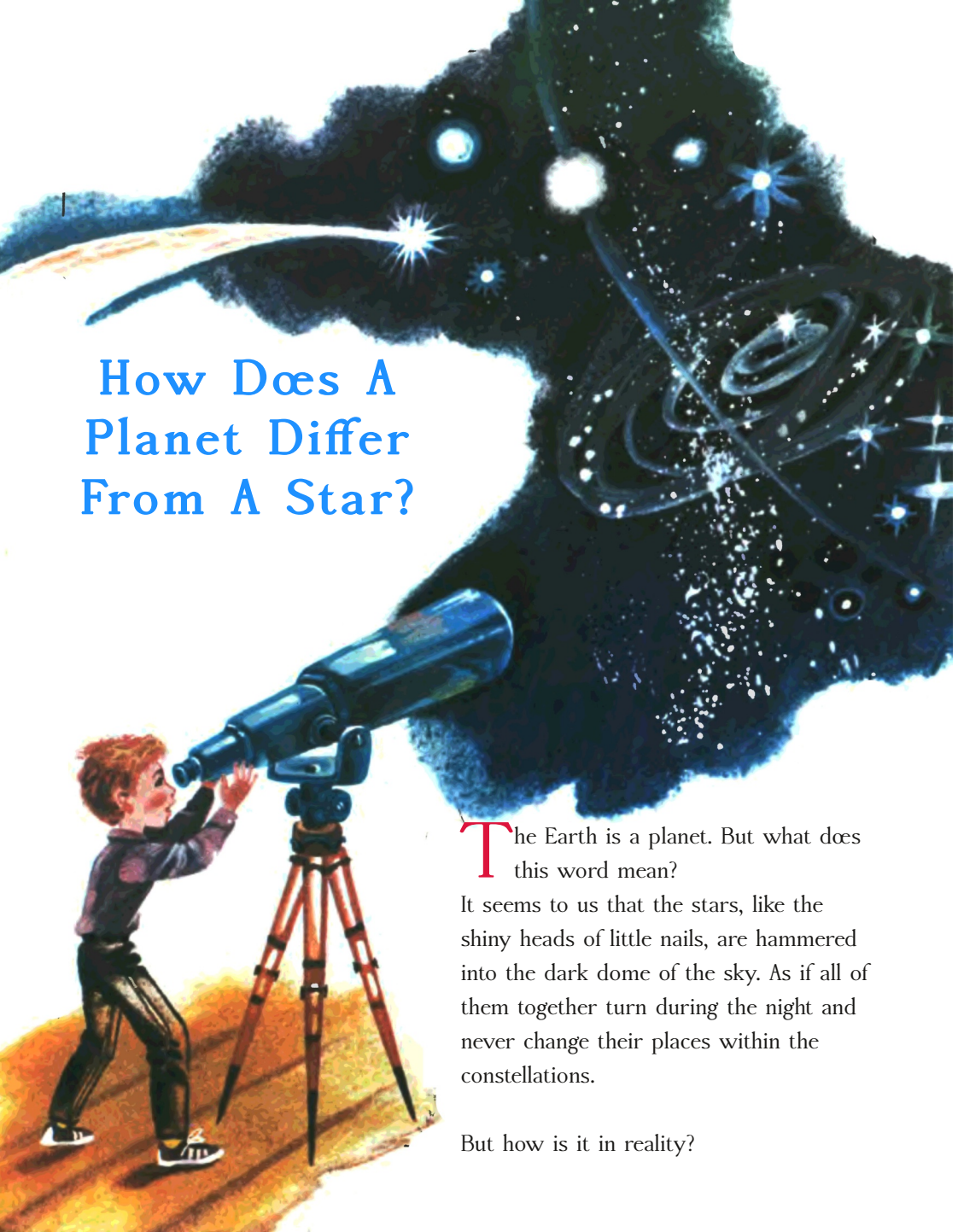
Scientists and engineers launched spacecraft. The satellites sped above the Earth, sending radio signals. From these signals electronic computing machines determined the height of the satellites' flight, and special recording devices helped to "draw" the shape of the planet Earth.



It turned out that our planet is not a perfect sphere at all.

The shape of our planet resembles a pear. The Earth-pear is flattened in the northern hemisphere and elongated in the southern.



A young boy with red hair, wearing a purple long-sleeved shirt and dark pants, stands on a patch of yellow ground. He is looking through a large blue telescope mounted on a wooden tripod. The background is a dark, starry night sky. A large, bright, curved object, possibly a planet or a comet, is visible on the left. On the right, there is a large, dark, swirling nebula or galaxy. Several bright stars are scattered across the sky, some with prominent diffraction spikes. The overall scene is a whimsical illustration of a child exploring the universe.

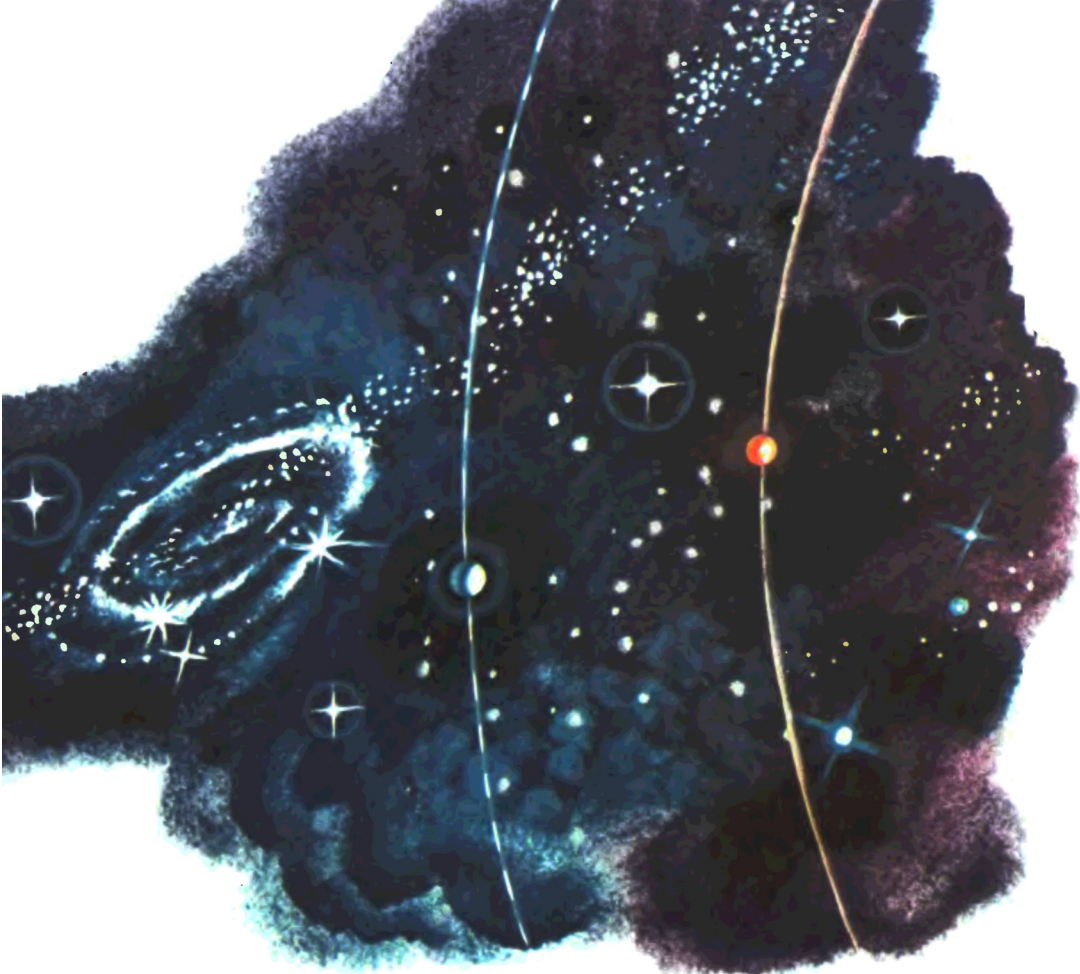
## How Does A Planet Differ From A Star?

**T**he Earth is a planet. But what does this word mean?

It seems to us that the stars, like the shiny heads of little nails, are hammered into the dark dome of the sky. As if all of them together turn during the night and never change their places within the constellations.

But how is it in reality?





Astronomers long ago noticed that from time to time strange restless stars appear in different parts of the sky. They seem unwilling to remain in place and to obey the common turning of the heavens.

If one watches these “restless ones” for many evenings in succession, one can see that they change their position. As if they quietly, quietly make their way somewhere unknown. At times they stop and even move backwards. Then they rush forward again, as though wishing to make up for lost time. These heavenly lights astronomers call planets. The word “planetos” is Greek and means “wandering.”



Many years passed before scientists discovered that the stars, like the Sun, are enormous fiery spheres, scattered very, very far from one another in cosmic space.

But the planets are not glowing hot heavenly bodies at all — they are cold. The planets “run” around their star along paths called orbits, some nearer and some farther away. Those that are closer to the star are warmer, and those that are farther away are colder.

Our Earth has a good path — its orbit. Not too far from the blazing Sun and not too close.

# Why Does A Planet Shine?

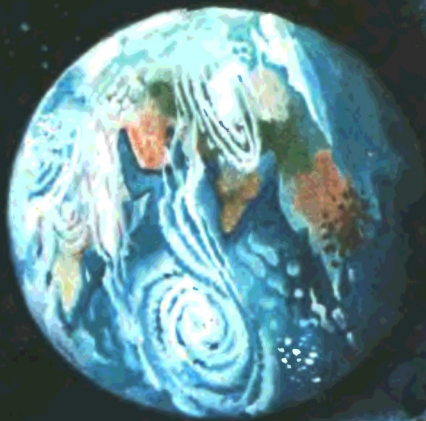
So, our Earth is a planet. And planets — although they seem like bright wandering lights in the night sky — are in fact made of cold rocks, sand, and even pieces of ice...

But why then do they shine?

It is not a simple question. Before answering it, I suggest a small experiment.



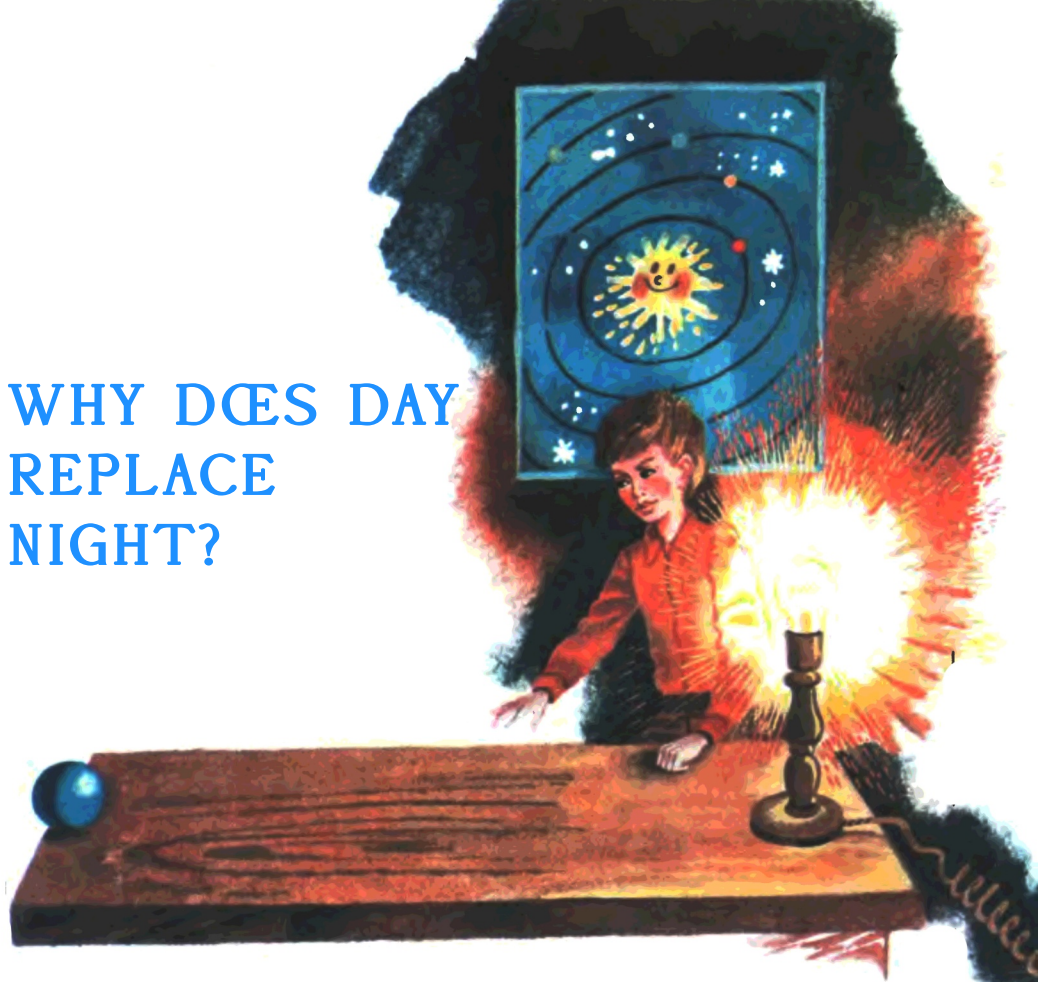




Spread a black cloth on the table and place a stone upon it. Draw the curtain tightly across the window. Leave only a small slit in the curtain so that a ray of sunlight falls directly onto the stone  
\\dots} And then a little wonder will happen. An ordinary grey pebble will shine in the darkness like the Moon in the night sky...

Here is the answer to the question: why do cold planets shine in the sky? The planets reflect the light of the Sun. When cosmonauts travel far from the Earth and look back at our planet, it appears to them as a shining sphere of beautiful blue colour. Why blue? Because most of the Earth's surface is covered with water. And water, in sunlight, appears blue.

# WHY DOES DAY REPLACE NIGHT?



Have you ever seen the Sun rise in the morning? Or how it sets, hiding in the evening beyond the horizon? At those moments the Earth seems especially vast. And yet we already know that the Sun is many times larger than our planet. How then can it rise, move around the small Earth, and hide behind its edge? Do you have a globe?

An ordinary school globe — a small model of the great Earth. If not, no matter. Take a ball. Let it be the Earth. Place the ball at one edge of the table, and at the other edge set a lamp. Let it be the Sun.

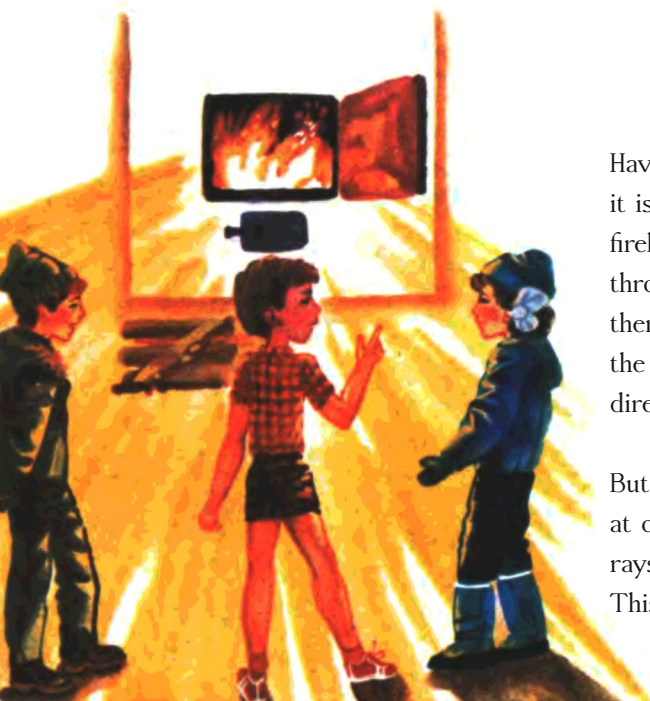


Look: the lamp — the Sun — lights up one side of the ball — the Earth. On this side of the ball it is bright; here it is day. And how can we make day come to the other half? Very simply — we must turn the ball. It seems simple, yet in fact we have made a real discovery: day on Earth changes into night because our planet is constantly turning, and the Sun in turn lights first one side of it and then the other.

The Earth is turning. On its dark side the night begins to fade; morning draws near. It is not the Sun that rises from behind the edge of the Earth at dawn, nor are the stars sailing above people's heads. Rather, the planet Earth itself is ceaselessly turning around its axis, and day in its cities, villages, fields, forests, and seas gives way to night, and night to day...



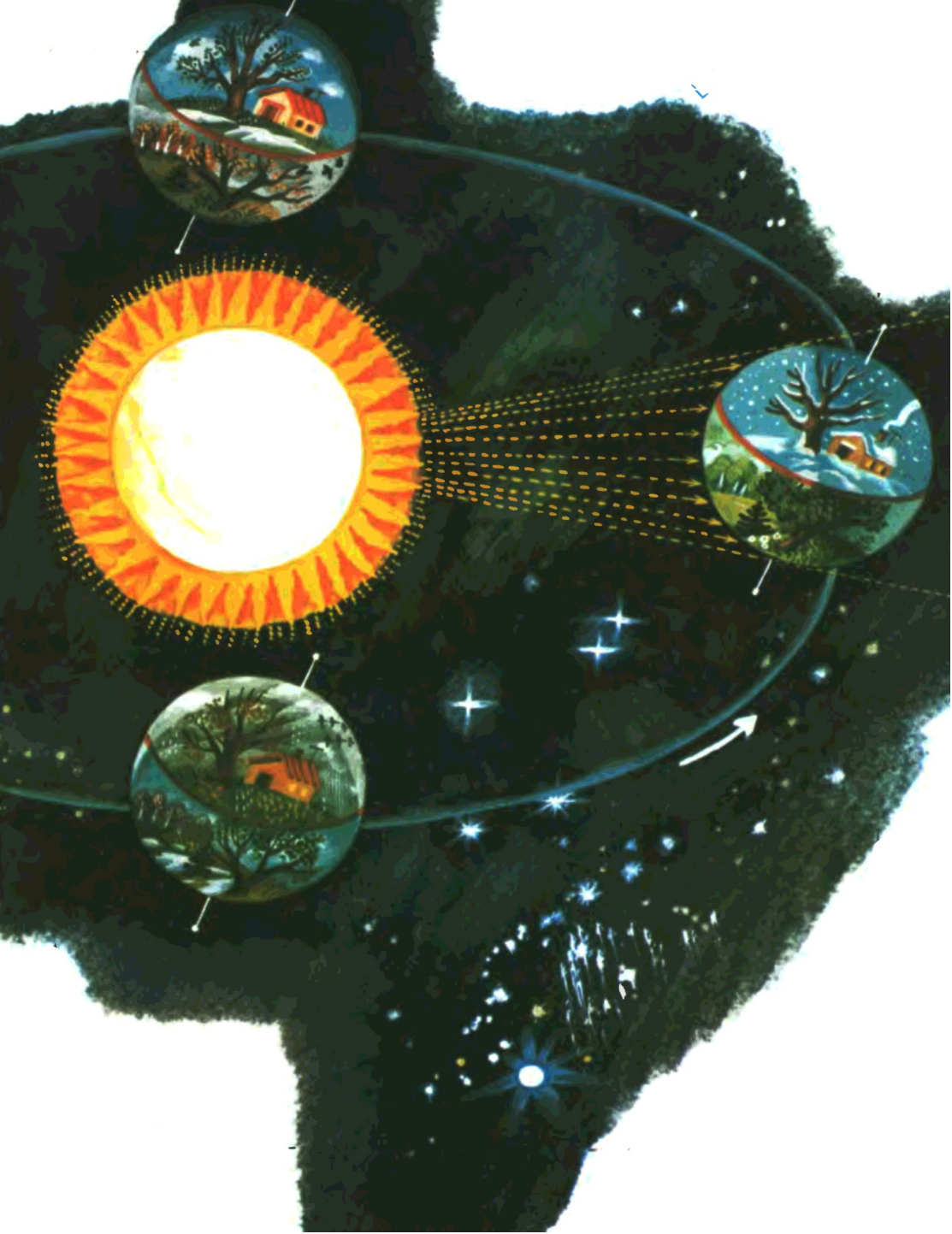
# Why Is It Hot In Summer And Cold In Winter?



Have you ever stood by a stove while it is being heated? The door of the firebox is opened, dry logs are thrown in, and tongues of flame seize them. You stand directly in front of the open door, and you feel hot. The direct rays of the flame scorch you.

But move a little to one side — and at once it is not so hot. The slanting rays are not as warm.

This is a very important observation





— about direct and slanting rays. Remember it.

You already know that the planets do not simply run around the Sun along their orbital paths. They both move and rotate. So the Earth turns and travels around the Sun. But it travels slightly tilted. Therefore, during one half of the year the direct rays of the Sun fall upon one hemisphere, and during the other half upon the other. When the hot direct rays fall upon the northern hemisphere, it is summer there. At that same time the southern hemisphere is lit only by slanting rays, which are not so warm, and therefore it is winter





there.

But in the next half of the year the Earth is already on the other side of the Sun, and the direct rays light the southern hemisphere. Then in the southern hemisphere it is summer. In the northern hemisphere, during that half of the year, it is winter.

### *Our Earth is beautiful.*

Here swift and slow rivers flow. Fields and forests grow green. Wild and gentle winds blow. Flowers bloom, and birds sing in many different voices. The sea surf roars. Wheat and apples ripen. The blue planet Earth is our home. Let us protect and increase the beauty of our native planet.



